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AGAINST CREATIVITY

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Creativity is typically defined as a disposition to produce valuable ideas. We argue that this is a mistake and defend a new definition of creativity in terms of the imagination. It follows that creativity has instrumental value at most and then only in the right circumstances. We consider the role of tradition and judgment in worthwhile creativity and argue that there is frequently a tension between greater creativity and the production of value.

1 Introduction

Creativity is almost universally praised and valued. Some go so far as to say that it is a virtue (Zagzebski 1996: 167; Kieran 2014). Many philosophers and psychologists offer a definition of creativity in terms of value: "There is an emerging consensus that a product must meet two conditions in order to be creative. It must be *new* [. . . and . . .] it must also be *of value*." (Paul and Kaufman 2014: 6); "Creativity is the ability to produce work that is both novel (i.e. original, unexpected) and appropriate (i.e. useful, adaptive concerning task constraints)" (Sternberg and

Lubart 1999: 3). We focus here on the definition of creativity as a trait of persons.[1] The standard and widely accepted view, then, defines *creativity* as a trait characterized by the disposition or set of dispositions of an individual:

1. To have novel ideas (*originality*)
2. Which are valuable; or produce objects which are valuable (*value*)

If this definition were correct, then creativity would be valuable, and since (other things being equal) more creativity would mean more original, more valuable ideas; greater and more substantial creativity would be better than less.

Our primary aim is to challenge the value accorded to creativity on this basis (we discuss briefly other reasons to value creativity). We therefore first tackle the claim that it is essential to creativity that it is disposed to produce objects of value. We reject this claim in Section 3—creativity can produce objects without value of any kind. In Section 4 we examine the widely cited "original nonsense" argument for value in the definition of creativity and find it unsound. We then move on, in Section 5, to the weaker reason for valuing creativity: even if creativity is not essentially directed towards producing objects of value, it nonetheless is highly conducive towards their production. From this point on, we restrict our attention to creativity in the arts and sciences, since the target claim looks more plausible with that restriction than without it. Even so, we find the contingent and instrumental value of creativity to be limited and constrained. We accept that creativity may raise the chances of value, though we note that the argument is not trivial. On the contrary, the argument reveals that in order for creativity to lead to value it typically needs to operate in conjunction with good judgment and a propitious tradition of work that is itself conducive to the production of valuable objects.

[1] One does also call acts, processes, and products 'creative'. In our view these are the manifestations of the trait of creativity. An object may be novel and even valuable, but if it was not produced by a person's creativity (e.g., in our view was not the product of their imagination), but was the result of mere accident, then it is not a creative product.

We aim to replace the standard definition of creativity with an improved account that rejects value but retains originality.[2] To originality we add three related conditions not normally found in definitions of creativity, the most significant of which is imagination. Creativity, in our view, is the disposition or set of linked dispositions of an individual:

1. To have novel ideas (*originality*)
2. Which are generated through use of the imagination (*imagination*)
3. And are many and varied (*fertility*),
4. And to carry through these ideas to completion (*motivation*).

As is implicit in this characterisation, these four component elements work together in a creative individual (an individual cannot be thought of as properly creative who sometimes has imaginative new ideas but when she does so is not motivated to work on them and when she feels motivated, cannot have the ideas). Creative acts and products are the manifestations of these dispositions. The argument against the standard view and in favour of the new account of creativity will also help us see that creativity is often in fact in tension with the aim of producing value.

2 A new definition of creativity: a role for imagination

According to the standard definition, creativity is a disposition to produce new and valuable ideas or objects. But not all ways of producing novel, valuable ideas are creative. For instance, it may be possible to produce such ideas by a random process; or by a purely mechanical process, such as following a simple rule. But these are *not* typically exercises of creativity.

[2] One might wonder whether novelty really is essential to creativity. Ruby Meager (1958) remarks of creativity that 'In the whole history of aesthetic appreciation this might appear as a local and temporary, rather than universal and essential, demand'. However, in our view, creativity does at least require that a creative individual have ideas that are not the same as those she has had in the past, and in at least that sense novelty is essential to creativity.

Perhaps it might be said that anyone using a random process or mechanically following a rule is unlikely to be *disposed* to produce new and valuable ideas: one might do so occasionally, as a mere accident. But it is possible to be disposed to produce new and valuable objects, without exercising creativity. Matthew Kieran (2014: 126–7) imagines a stroke victim who tries very hard but unsuccessfully to write. In the attempt he produces beautiful abstract patterns. So the stroke victim meets the standard definition of creativity—he is disposed to produce new and valuable objects. But he is not thereby creative. This shows that the standard view is mistaken: disposition to produce novel, valuable objects is not sufficient for creativity. The missing ingredient is the imagination. In our view, this person, in this respect, is not creative, since the abstract patterns are not the products of his imagination.[3]

Perhaps what the stroke victim lacks is not imagination but the intention to produce the patterns. However, one can intentionally produce new and valuable works without exercising creativity. Consider someone who is painting by numbers but errs in following the wrong rule for applying the colours. The result may thereby be novel and even beautiful; it was intentionally produced. But it was not the exercise of creativity.

The imagination is the cognitive source of genuine creativity. What is the imagination? It is an ability to produce a particular type of mental representation, but it is widely considered to have very different forms and its nature is the subject of significant dispute.[4] As far as possible, we are liberal about the kinds of imagination that may play a role in creativity. For instance, the

[3] Kieran (2014: 126) himself says that the stroke victim is creative in a minimal sense. But he clearly also recognizes some inadequacy in this, since he uses the case to motivate a richer sense of creativity that he goes on to develop.

[4] It might be possible to drop the reference to *mental* representations. Some argue for the possibility of creativity in computers, in which case the representations are not mental (see, e.g., McCormack and d'Inverno 2012). We do not take a view on this, but do note that typical approaches to computational creativity follow the pattern we attribute to human creativity: the generation of ideas from a space of possibilities, followed by a process of evaluation.

imagination may produce novel ideas deliberately (as when a scientist spends a great deal of time trying to develop a theory; or a writer edits and rewrites her work). The imagination may also generate ideas spontaneously (as when a scientist is suddenly struck by a hypothesis, or a writer by a novel image).[5] For example, Darwin tell us in his *Autobiography* that he was struck on re-reading Malthus's *Essay on Population* that it contained the missing principle he needed to explain evolution. Insofar as this was not obvious to just anyone, Darwin's creative act involved being able to imagine his theory enhanced by the addition of this new principle.[6] The creative use of imagination may be accompanied by mental imagery (as when an artist mentally pictures the artwork she is about to produce, or a composer hears a tune running through her head); but it need not be.

In our view the central function of the imagination is that it enables one to scan, consciously or unconsciously, some subset of the space of relevant possibilities. In short it allows one to see possibilities.[7] There are many ways that this can occur; here we mention two that we take to be particularly significant in creativity. First, an individual may set herself a problem that needs to be solved by satisfying a number of different constraints or desiderata; it may not be obvious that they can all be satisfied simultaneously, or, if they can, which way of doing so is the best. A more imaginative individual will be able to find an option that meets all of her constraints, in the first case; and a larger number of options (than a less imaginative individual would find) in the

[5] Walton (1990) distinguishes the spontaneous and deliberate use of the imagination.

[6] We owe this example to Berys Gaut.

[7] The relationship between imagination and possibility is very contentious. As far as possible we do not take a stand on this. It is likely that the relevant sense of possibility here is epistemic (see below). Note that in this context the object of the imagination is the artwork or theory etc. The creator is imagining how a poem would work with a certain metaphor or what consequences a hypothesis might have with a new assumption. This means that the writer of fiction is imagining what her story would be like with a certain development. So it is not an objection to this account that the story might be about something the writer knows to be impossible, for example someone travelling faster than light. The imagined story as an artwork is possible even if its content is not. (How in fact we imagine things we know to be impossible is another, albeit important, question.)

second, which are then available for evaluation and selection. Secondly, an individual may produce original works of art or scientific works by combining existing ideas together in novel ways, for example, by finding an analogy between existing successful works and the present task.[8] And of course these two processes are often combined, when a series of constraints are met by the adaptation of one or more existing ideas.

The same sorts of imaginative process play a role in scientific and artistic creativity. Consider, for instance, Kuhn's idea that scientific research is governed by a *paradigm*, a constellation of related exemplary scientific achievements which sets the agenda for future research (Kuhn 1970: 187). The paradigm enables scientists to conceive of the world in a particular way, as conforming to the key theories of the paradigm: the scientist learns to see one thing as like (or as unlike) another. For example, an Aristotelian thinker would see the motion of the Moon around the Earth as something completely different from the motion of a projectile or falling object, whereas the Newtonian thinker sees these as variant manifestations of fundamentally the same kind of motion. Consequently certain scientific problems are seen as similar to one another and so calling for similar solutions—in particular they are seen as similar to the field's founding problems and solutions, the paradigm problems/exemplars. In some cases the parallelism is straightforward. Book 3 of Newton's *Principia* applies the general laws and theorems concerning motion and gravity that are proved in Book 1 to the astronomical phenomena of the Solar System, for example estimating the ratios of the masses of the Sun and major planets, accounting for the observed motions of the planets and comets, and such like. Newton, however, did not solve all such problems: various puzzles concerning the motion of the Moon defied solution until Alexis Clairaut's *Théorie de la lune* showed how they could be accounted for within the Newtonian system. The problems Clairaut solved are of the same type as those Newton had already tackled and the solutions were likewise of the same kind, differing principally in their greater mathematical sophistication.

[8] Currie and Ravenscoft (2002) call this *creative imagination*; but we take it that this is only one form that creativity can take.

In Clairaut's work, the problems and the physical principles behind their solution are obtained by straightforward analogy with Newton's problems and solutions to those problems (even if working out the mathematical details of the solution was far from trivial). In other cases the analogy is less direct. In the 1780s researchers were interested in the forces of attraction and repulsion among charged bodies. Several devised experiments to generate data from which they could infer a suitable formula. Coulomb saw the problem as analogous to Newton's problem of gravitation, both being problems of finding the forces between bodies with certain properties, and so proposed an analogous solution, an inverse square law, even though the analogy is not exact (the sign of the force is the opposite, and Coulomb has to accommodate positive and negative charge whereas Newtonian mass is always positive). Coulomb also devised an instrument for measuring electrostatic forces that is an analogue of Cavendish's torsion balance, except that whereas the latter is several meters across in size, Coulomb's balance is smaller than a dinner plate.

The proposal is, then, that a scientist chooses her problems in large part on the basis of their similarity or analogy to existing problems. And she searches for possible solutions by considering analogues of solutions to existing problems.[9] So while imagination is the ability to search through a space of possibilities, what enables the imagination to do this well (to light upon possibilities that have some chance of having value) is that it works within a tradition. The tradition of problem-solving both constrains and guides the imagination's search through possibility space.

Can the imaginative component of creativity in the arts be understood in a similar way, as searching the space of possibilities by looking for analogies, connecting possibilities to prior

[9] The hypothesis that analogical thinking is at the core of scientific creativity and judgment is developed by Margolis and has independent confirmation from research carried out by Dunbar (1996) in laboratories observing scientists engaged in hypothesis formation. See also Gentner, Holyoak, and Kokinov (2001) and Gentner and Jeziorski (1993).

models and exemplars, given by a tradition? Carroll (2003: 217) emphasizes the importance of tradition for creativity:

> Tradition . . . is indispensable for creativity . . . , because it serves to fix the horizon of possibilities that lie before the artist. It focuses the artist's attention upon those options that will be intelligible—to the artist and her audience—against the historical background of a practice.

When Beethoven sat down to write his first symphony in the late 1790s the symphony was well established as a musical form. Beethoven followed closely the models of his predecessors, especially Haydn, but also Mozart. So, for example, Beethoven uses exactly the same orchestra as Haydn; the symphony has the same number and kind of movements as its predecessors; the first movement follows classical sonata form to the letter, and like several of Haydn's later symphonies it opens with a slow introduction before the first subject appears. Analogies appear at the level of detail also, with many ideas resembling those found elsewhere: basing the first subject of the first movement around an ascending arpeggio is a very common device; in several places there are strong echoes of ideas in his predecessors' symphonies (e.g. Mozart's *Jupiter* symphony). Adopting a certain model also poses problems to be solved: the second subject would be expected to contrast with the first, so Beethoven uses a descending scale; the slow introduction cannot be unrelated to the rather faster main body of the first movement, so Beethoven has to deploy ideas in the latter that recall the former, and so on. The creative process evolves subject to a considerable variety of constraints.

To point out the role of models and exemplars as well of constraints and conventions in the composition of Beethoven's first symphony is not to deny its originality. On the contrary it is to explain that the creative exercise of the imagination is not a random walk in the entire space of possibilities, but is the exploration of a particular subspace, guided by models and constraints.[10]

[10] Carroll (2003: 217) cites Elster (2000) in emphasizing the importance of constraints in narrowing down the range of possibilities that confront an artist, without which the result would be paralysis rather than new work.

This account of imagination raises at least two significant worries. First, what about uses of the imagination that produce ideas that are not in fact possible (mathematical proofs that are inconsistent, for example)? Secondly, if imagination often proceeds by finding analogies with existing models, does it not follow, counterintuitively, that creativity is often derivative? Is there really nothing distinguishing a derivative from a genuinely creative work of art or scientific theory?

In response to the first problem: an appropriate notion of "possibility" will help here—perhaps the possibilities are those ideas such that the subject cannot immediately know that they don't have the value sought after (e.g. a conjecture that the mathematician cannot immediately see is inconsistent, or an idea for a plot development whose effect on dramatic tension is not obvious). We note that in practice our imagination is often imperfect in the sense that we only partially imagine a possibility. The possibility may be presented in one way so that the scientist or artist may not be able conceive of how it will appear when made concrete. It may occur to a composer that her development of a complex fugue might suitably include an inversion of the subject in augmentation. But she may need to hear the passage to be sure it has the required effect. It might occur to a scientist that the structure of some molecule under investigation is fundamentally the same as that of some other molecule, with the addition of certain functional groups. Yet she may not be able to see immediately whether such a molecule is stable or whether it meets pre-existing constraints (e.g. those imposed by empirical results): further calculation and experimentation may be required. This partial understanding of possibilities will often arise on our account, because the imagination will typically present a possibility in the guise of an analogy to something else: like *x* but different in these respects . . . What exactly that possibility is like and whether it does what the creator wants may require a process of deduction, calculation, experimentation, or just trying it out. Consequently, creative activity often involves interaction between the process of imagination and a distinct process, such as inspecting a concrete object or attempting a proof.

In response to the second problem, we concede that even derivative works of art may use imagination to some extent, and thus count as minimally creative. More creative artists and scientists are more imaginative: they are able to scan more possibilities; they use more remote analogies and bring together more disparate ideas than less imaginative individuals (Dunbar 1996). They are not satisfied with finding just one solution to the problem they have set for themselves, but find many, from which they can then choose the best. Furthermore, seeing which possible analogies might be useful itself requires the use of imagination: the creative thinker considers whether and how a new analogy might be appropriate and may be the route to a solution to her problem or the source of new ideas for her artwork.

Beethoven's contemporaries, such as Luigi Boccherini and Anton Eberl, were presented with the same models and constraints as he, yet did not write the same symphony. The first symphony did not just occur to Beethoven's mind; on the contrary, the work was the product of a lot of thought over several years during which many ideas (prompted by experience of exemplars, as discussed above) will have occurred to Beethoven. Not all of Beethoven's ideas were good and many of his musical ideas might well have occurred to Boccherini and Eberl (Eberl's work was itself often mistaken for Mozart's). Beethoven was not above earning money by using ideas that were of only modest quality. However, for his first symphony he rejected all but the best ideas. That is to say, the exercise of creativity by Beethoven is accompanied by the exercise of judgment, rejecting ideas that failed to solve the problems he faced and which failed to meet a high standard of musical value.[11] The tempering of creativity with judgment is not a simple matter of

[11] Consider Poincaré's view of discovery in mathematics, "What, in fact, is mathematical discovery? It does not consist in making new combinations with mathematical entities that are already known. That can be done by anyone, and the combinations that could be so formed would be infinite in number, and the greater part of them would be absolutely devoid of interest. Discovery consists precisely in not constructing useless combinations, but in constructing those that are useful, which are an infinitely small minority. Discovery is discernment, selection." (Poincaré 1908/1914: 50–1.) We take it that what Poincaré calls 'discovery' is the combined operation of creativity and judgment as we have described them. (We are grateful to Mike Stuart for this reference.)

employing first imagination and then judgment; rather it is interactive and iterative, with repeated exercises of imagination and judgment, both at the small scale (does this one bar-long musical phrase work?) and the larger scale (is the development section too long and does it suit the character of the piece?). So judgment is not exercised not just on the finished product but at every stage in its development. Judgment, in our view, is not itself part of the creative process *per se* but is both a guide and a prompt to it. We return to the relationship between creativity and judgment later.

The other elements of our account of creativity can be treated more briefly. Fertility is important if we are to think of creativity as a trait. An individual might have one imaginative and novel idea—one typical of a creative individual, but we would not normally attribute creativity to an individual on the basis of one idea alone (but see the next paragraph). Motivation we regard as important to the trait of creativity as it captures the idea that the creative individual is one who is disposed to bring new drawings, constructions, music, theories, and such like into existence, in short has an "urge to create.[12] Creativity is not merely an ability: someone who could create things, but does not make the effort to do anything of the sort is not a creative individual.[13]

As a disposition or bundle of connected dispositions, these characteristics of a creative individual need not always be on display. As for all dispositions, the manifestation of creativity requires the right stimulus or triggering conditions to be present. In particular a creative individual needs the opportunity and resources to think and then to develop her ideas and to bring them to fruition. An individual whose life gives her no space for creative thought may still be a creative individual, likewise an artist who cannot afford the materials her work requires. A disposition may also be present without its manifestation even when the stimulus conditions are propitious: dispositions

[12] Collins and Amabile (1999) emphasize the importance of motivation in understanding creativity, as does Kieran (2014). Götz (1981) takes production or making things to be central to creativity.

[13] We leave open the question of whether the motivation to create needs to be non-instrumental (i.e. a desire to create for its own sake) or whether an instrumental motivation can be sufficient (e.g. a desire to win a Nobel prize, which generates a desire to produce novel, imaginative science).

can be subject to interferers (antidotes/masks, finks). The processes of creativity may be blocked or interrupted. Depression, for example, can stifle creativity; though stifled it is not removed. Such a person is still creative even though she is not creating, just as a talented footballer's skill may be masked but not removed by a minor injury. That said, creativity can be lost, for a number of reasons, from brain injury (Eslinger *at al*. 2007: 788) to lack of use—creativity unexercised may diminish.

3 Creativity is not a disposition to produce value

The standard definition of creativity, endorsed or used by many philosophers and psychologists, is of a disposition to produce ideas that are novel and valuable. For example: "What is it to be a creative person? There is a minimal sense according to which it just is to possess the ability to produce novel and worthwhile artefacts" (Kieran 2014); "Creativity is the ability to come up with ideas or artefacts that are *new*, *surprising*, *and valuable*" (Boden 2010: 29). (See also Cropley and Cropley 2013: 5; Barron 1955 and Runco and Jaeger 2012 similarly speak of the "effectiveness" or usefulness of ideas.)

This is a mistake. Creativity should not be defined as the disposition to produce valuable ideas. We give three arguments for this conclusion. First, creativity can produce objects of wholly negative value. Secondly, it is possible to know that an object has been produced creatively without knowing its value. And, finally, it is perfectly possible for creative people to manifest their creativity—one and the same disposition—in producing good ideas (on some occasions) and bad ideas (on other occasions).[14]

[14] Grant (2012) similarly give an account of creativity (which he calls "imaginativeness") which need not produce value, though he does insist that ideas can be creatively produced only if it is reasonable for the creator to think that her ideas would be valuable, or achieve something. We deny this, on the basis of the same arguments as given here: ideas can be creatively produced even if they are not good, and the creator does not (and could not reasonably) think that they are.

3.1 Creativity without value

Defenders of the standard view are not always completely clear about the kind of value they have in mind, when they say that creativity is a disposition to produce value. There are three obvious possibilities:

First, creatively produced objects might be good all things considered. For instance, they might have moral, social or political value; scientific value (e.g. truth, knowledge, or understanding etc.); aesthetic value (e.g. beauty or sublimity), and so on.

Secondly, they might not be good, all things considered, but nevertheless good of their kind (leaving open whether the kind is itself good).

Finally, an object might be good in virtue of being good for the individual who produced it, giving her pleasure, satisfying her preferences, or contributing to her well-being, objectively considered.

We argue that it is possible to be creative without being disposed to produce value in any of these ways.

3.1.1 Creativity without all things considered value

Creativity can be exercised in the production of objects of no value, or even negative value. Creative accountants may find new ways to hide profits or to avoid tax; their ideas are socially and morally harmful, and may produce no compensatory benefits. The zealot of the French Revolution, Jean-Baptiste Carrier, executed his victims in increasingly novel and imaginative ways, including the infamous "Republican Marriage" whereby a male prisoner and a female prisoner would be bound together, naked, and then thrown into the Loire. Creativity can be put to

work in doing bad and wrong acts, just as in doing good.[15] Nor in such cases does the expression of creativity mitigate the harm produced so we can say that the torture was horrific, but at least it was produced creatively; if anything, that very fact makes things worse.

So creativity cannot be a disposition to produce objects that have objective value.

3.1.2 Creativity without attributive value

Although Carrier's republican marriage was not good all things considered (rather the opposite), perhaps there is something else to be said in its favour. Considered as a method of terror, it was very good—effective at inspiring fear in enemies of the revolution and causing suffering in its victims—thus excellent according to the standards of its kind. So we should consider the proposal that all creatively produced objects are good with respect to their kind.

Although it avoids tying creativity to value all things considered, this proposal faces the problem that objects typically belong to more than one kind. Something might be good *qua* member of one kind (method of torture) but not of another (just system of punishment). It would be a contradiction to say that Carrier was creative, in virtue of producing an effective means of terror, but not creative, in virtue of failing to produce a just punishment. We can avoid this inconsistency by stipulating that creatively produced ideas are good *qua* some relevant kind, which may (though need not) be the kind intended by their creator.

But this cannot be right either. The accountants of Enron created fictional profits for the company from joint ventures that did not exist and found novel ways of hiding the company's debts from its auditors. Some of what they did was immoral and some was illegal, so their ideas were plainly not all things considered good. Were they good of their kind? Not if the relevant kind is: moral and legal accounting. Perhaps instead the relevant kind is: accounting that pleases the shareholders. Or: accounting that keeps the company afloat. But even in these terms, their

[15] Cropley and Cropley (2013) discuss creative criminality.

ideas were successful only in the short term, after which the company went bankrupt leaving the shareholders facing disaster. These accountants were certainly creative, but their ideas were not good in any relevant respect.

Consider a scientist who devises a theory that turns out not to be true. It is most natural to think that her ideas should be assessed in terms of their scientific value; that is, their value *qua* scientific theory. But her theory may have no scientific value whatsoever. It may not even be approximately true; it may provide no knowledge and no understanding. Percival Lowell's theory that there are canals on Mars, an imaginative explanation of apparent lines that Giovanni Schiaparelli and he perceived, is one of very many valueless but creative scientific ideas. Trofim Lysenko's theories had no value whatsoever—its rejection of Mendelian inheritance meant that they stood no chance of being right nor even of being wrong in an interesting way that might have acted as a spur to others. Nonetheless, one can easily see creativity in the attempts of Lysenko and Izaak Prezent to devise a theory of plant development and inheritance, 'natural cooperation' that mirrored the political lessons of Marxism-Leninism. Similarly, the works of creationist scientists can be dismissed as scientifically worthless even though they may at the same time be judged creative in trying to achieve a theory that accommodates both the scientific evidence and a literal reading of the Bible. Indeed, one might argue that attempting to save a false theory from refutation is particularly demanding of a scientist's creativity, precisely because the task is so difficult.

Of course we acknowledge that a scientific theory may not be true (even approximately) but may nevertheless have some kind of value, contributing in some degree to the progress of science. Discovering why the theory is false may increase our grasp of the subject matter and as a result we may turn to a more fruitful path. Mill's (1859) defence of free speech makes a similar point—we may understand the truth, and why it is true, through critical engagement with false opinions and theories. In order to gain knowledge by inference to the best explanation, it is important to have a range of competing (false) hypotheses with which to compare the truth, and so be sure that it is indeed a better explanation of the phenomena.

For example, Lamarck's ideas about the mechanism of evolution were mistaken but nonetheless had an important and valuable influence on the work of Darwin and other naturalists. Be that as it may, that influence is not what makes Lamarck's ideas creative. His theory of adaptation through the inheritance of acquired characteristics would have been just as creative had it influenced no-one; and therefore had neither direct nor indirect value, *qua* scientific theory. Below we mention the work of Nikola Tesla which included worthless ideas for a thought camera and a death ray, and Herschel's hypotheses about life on the Moon.

In the arts one may also find work that has no value but is nonetheless the product of creativity, though it will be far more contentious than in the sciences which work this is. Conceptual art is held by some commentators to include many example of art of no aesthetic or other intrinsic value—yet they can still recognise the creativity that produced the work. Elisabeth Schellekens (2007) locates the aesthetic value of conceptual art in the ideas that it expresses (which she says, are typically art-reflexive ideas, socio-political ideas, or philosophical ideas). In which case a work might lack artistic value, and thus fail to be good *qua* conceptual artwork, because the idea being expressed is confused or in other regards lacks value; nonetheless the attempt to express that idea might be creative. For example, Ewa Partum's Active Poetry involves scattering many pieces of paper each with an individual letter of the alphabet in widespread locations, their accidental distribution creating the poetry. The idea is that by deconstructing language in a very literal way, the structures of language are revealed. One might consider that this project in fact fails to tell us anything revealing about language, yet at the same time one could also accept that thinking up this way of attempting to explore the nature of language required creativity, i.e. it is a creatively produced a work of art that has no aesthetic value and so is not good of its kind.

In the film, *The Producers*, Max Bialystock and Leo Bloom creatively put together a terrible script, appalling director and useless lead actor in order to produce a musical, *Springtime for Hitler*, which has no aesthetic value whatsoever. It is part of their plan that the play has no merit, no redeeming features at all; they intend it to be so bad that it closes immediately (making them

rich, as they have sold shares in it many times over). They are highly creative. But what they create, *Springtime for Hitler* not only has no aesthetic value, and so does not meet one relevant standard (aesthetic merit); it also does not meet their intended aims, since audiences find it funny and it turns out to be a financial success (though not for them). By the standards of the kind they intend it to fall under ("a play that closes on its first day"), it fails. The exercise of their creative dispositions has produced a work of art without value of any relevant kind.

3.1.3 Creativity without prudential value

If creativity is not a disposition to produce ideas that are valuable, all things considered, nor that are good of their kind, what kind of value can they have? Perhaps they have prudential value: they are good for the individual who creates them.

Here it is important to distinguish two ways in which creativity might be valuable for an individual: first, the products of creativity might be good for her, or secondly, the creative process itself might be good, aside from the value of the products. It is the former case in which we are interested, as we are targeting the view that the value of creativity is explained by its being a disposition to produce things of (independent) value. We will return briefly to the value of the creative process later.

There is a wide range of views about prudential value, but they can be divided roughly into theories according to which well-being is objectively conceived, as an "objective list" of things good for you; or as a subjective matter, of preference satisfaction, pleasure, or some combination of these.

It is not plausible that the objects produced by creativity always give pleasure to or satisfy the preferences of their creators. On the contrary, creative individuals are often intensely unhappy with their work, setting themselves the highest of standards which they inevitably fail to meet. It is estimated that Kafka burnt ninety per cent of his works during his life (and asked Max Brod to

destroy the remainder after his death). Monet destroyed thirty of his water garden paintings and frequently damaged other works too.

So it is not plausible that creativity is a disposition to produce ideas that please their creator or satisfy her preferences. But perhaps they always contribute to her well-being, objectively conceived. According to this sort of view, Monet's paintings must be good for him, even if he does not recognize them as such and they cause him distress rather than pleasure. Perhaps it is good for you to create beautiful objects, perhaps producing the paintings constituted an achievement, and achievements are always good for you. But even the link between creativity and prudential value can be maintained in this particular case, it does not always hold. Was creating *Springtime for Hitler* an achievement? One might say so, but only ironically. Or consider Jean-Baptiste Carrier once more, devoting his mind to finding ever more ingenious and horrible methods of torture and terror. Was this an achievement? Was it good for him? Surely not. The novel methods of torment (and the creative work of conceiving of them) did not improve his life. It would have been far better for him to have done something else.

Creativity is not a disposition to produce value, all things considered; or ideas that are good of their kind; or ideas that have prudential value. These are not the only, but they are the most obvious ways in which creativity might produce value and there does not seem any reason to suppose that it produces value of any other sort. Of course creative individuals can produce valuable objects, but they need not.

3.2 Recognising creativity without evaluating ideas

How do we recognize creativity? Do you need to know the value of what has been produced, in order to know whether it has been produced creatively?

In World War 2 both sides used elaborate deceptions against their enemies. Operation Mincemeat disguised a dead body as a Royal Navy Officer carrying faked letters to deceive

German High Command regarding Allied invasion plans in Italy. In Operation Greif, Otto Skorzeny and other English-speaking German soldiers dressed in American and British uniforms in order to misdirect allied tanks and infantry while sowing confusion and alarm among allied forces during the Battle of the Bulge. We can detect and compare the creativity in these undertakings without assessing the nobility or otherwise of the causes they served.

Leonardo da Vinci drew remarkable sketches for flying machines. We do not need to know whether Leonardo's designs stood any chance of working nor whether if they did they would have been of use to anyone in order to judge that these ideas manifested his creativity; instead we need to know how imaginative, novel and fertile were his ideas, and how strong his motivation to bring them to fruition.[16]

3.3 Creative individuals may produce ideas of variable quality

Above we argued that we could judge Otto Skorzeny as creative without approving of or even assessing the value of what he did. All we need to see is that, just like Ewen Montagu, the mastermind behind Operation Mincemeat, Skorzeny was imaginative and original; he had many such ideas and was strongly motivated to carry them to completion. In these respects, their cognitive and non-cognitive dispositions were very similar. In short: they were both creative and in the same way.

Similarly, we can often see the same set of dispositions within one individual sometimes creatively producing objects of value, sometimes creatively producing objects that are worthless. Nikola Tesla had some extremely good ideas, for instance about alternating current, and some extremely bad ones, including a plan for a death ray, as well as worthless theories about spacetime and the electromagnetic field. William Herschel discovered the planet Uranus and also

[16] Grant (2012) also discusses da Vinci as an example of creativity without value (though he argues that if da Vinci is creative, it must have been reasonable for him to think the machines might work; this does not seem necessary to us).

infrared radiation; yet he also had entirely false ideas about other planets (that the Moon was rather like the English countryside, that the surface of the Sun was cool and inhabited). It is simply not plausible that one set of dispositions (creativity) produced the good ideas of Tesla and Herschel and quite another generated the bad ones. Distinguishing between their good and bad ideas in term of creativity is neither psychologically realistic nor explanatorily appropriate nor descriptively useful.

4 An argument for the standard view

Defenders of the standard view do have an argument that creativity is a disposition to produce value: the "original nonsense" argument. Paul and Kaufman (2014: 6), for example, tell us that a creative product "must be *new*, of course, but since novelty can be worthless (as in a meaningless string of letters), it must also be *of value*" while Stokes (2016: 248) asserts:

> . . . most theorists maintain that creativity requires value. As Kant put it, "there can also be original nonsense" [1781/2000, 5: 308, p. 186], and nonsense is not creative. So, creativity requires, in addition to novelty, that an *x* be of some value to its make and/or its context of making.

In brief then the argument is this. Original ideas can be nonsense. But creativity cannot be exercised in producing nonsense. So creativity cannot be a disposition to produce original ideas. Something else is required, namely value.

We have argued elsewhere (Hills and Bird 2018), however, that Kant was not offering the argument attributed to him here, but that he has a view of creativity ("genius") similar to our own, whereby creativity can produce good or bad ideas, and to produce good ideas consistently, it has to be tempered with good judgment.

Moreover, the original nonsense argument is not very good.

First, let us assume that the original nonsense has no content at all—such as the meaningless string of letters referred to by Paul and Kaufman. It is plausible that creativity is not manifested in producing ideas with no content. So something else is required—the '*x*' that Stokes refers to. But even if that is right, it does not follow that *x* in question must be value, the ideas produced by creativity must be good ones: all that is needed is that they have content. And that is secured in our definition of creativity, requiring that the ideas be produced by the imagination (which, in our view, is essentially representational).[17]

If, on the other hand, the "nonsense" in question is contentful, then it can be a manifestation of creativity, at least of a minimal kind. Creativity can be manifested in commonplace ways: linguistic creativity is the ability to produce entirely novel sentences, for instance. Most people who can do this would not thereby regard themselves as creative. But nevertheless this use of the term is not inappropriate. We can regard this as a minimal degree of creativity, differentiated from substantial creativity by the greater imaginativeness and originality expressed in the latter (but not necessarily by any greater value of the objects produced).[18] If you produce ideas that have some content, and are original, but are regarded as "nonsense" because they are not especially interesting or useful in the context then you may be manifesting minimal but not substantial creativity.

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[17] It is generally agreed that exercises of the imagination are representation and so intentional states (Kind 2016: 3). That imaginings have intentional content is entailed by our view that the imagination enables searching the space of possibilities.

[18] The expressions 'little-c-creativity' and 'Big-C-Creativity' are frequently used by psychologists. Minimal or little-c-creativity is creativity to the degree that pretty well every human beyond infancy possesses, whereas substantial or Big-C-Creativity is the greater and relatively unusual degree of creativity possessed by individuals we tend to call 'creative'. We have not used these terms because there is no clear consensus on where the boundary between little-c-creativity and Big-C-Creativity lies. The distinction is often made where we make the minimal/substantial distinction, but some take Big-C-Creativity to be the kind of creativity characteristic of creative geniuses.

5 The limited contingent and instrumental value of creativity

We have argued already that creativity does not always produce value. But there may be nonetheless a significant, if weaker, relationship between the two. Let us concentrate on two areas where creativity is thought to be particularly valuable, the arts and sciences. First of all, we must concede that minimal creativity is valuable here, since it is required in order to engage in the kinds of activity characteristic of a normal human life, including the production of works of scientific and aesthetic value. But those who praise creativity clearly have more than minimal creativity in mind. We might put their claim as follows: the more creative the process, the more likely it is to produce more (aesthetic or scientific) value.

According to our definition, greater creativity means more ideas, more originality, more imaginativeness, and a greater motivation to bring the objects to completion. Is this set of dispositions more likely to produce objects of a greater scientific or aesthetic value than a less creative set? It seems plausible that it might: the process of creation, the joint exercise of originality, imagination, fertility, and motivation, might be selectively directed towards the more valuable of the possible works. When scientists generate a new hypothesis, the process by which they do that could well give the resulting hypothesis a greater chance of truth than a hypothesis selected at random. Likewise more creative processes are more likely to produce aesthetically valuable works of art. But though this sounds plausible, it is not true that more creativity tends to produce more value. First, because though the track record of creative individuals producing value in science and the arts looks impressive, this is misleading, for their less successful efforts tend to be forgotten. Secondly, because extra creativity does not tend to produce more value, except in very specific and unusual circumstances.

5.1 The scientific and artistic objects that we value are not typical of the products of creativity.

Is it true that more creative processes are more likely to produce more value? To confirm this hypothesis, you might think that you could just look at the track record of creative individuals in the arts and sciences. But matters are not so simple for two reasons: first the data are not straightforward to interpret; secondly, since the products of the arts and sciences are the result not only of creativity but of other factors, one must attribute their successes (when successful) to creativity together with these other factors.

Arguably most scientific ideas that get as far as publication have a high degree of truthlikeness (nearness to the truth).[19] Science today is a highly integrated, and well-resourced activity, which in central areas is founded on well-confirmed theories and supported by well-tested techniques. It was not always so. It is possible for scientific cultures to flourish whose ideas are much further from the truth. Ancient Greek science was an important achievement, but much of the scientific work of its greatest exponents, Aristotle, Ptolemy, and Galen, was not only mistaken but deeply anchored in false assumptions (e.g. the circular, geocentric model of planetary orbits and the humoural theory of physiology). These individuals and their contemporaries were often highly creative, but their creativity was not itself conducive towards to the truth, knowledge, understanding, or anything else of scientific value. Instead, it tended to lead them to novel but false hypotheses which creatively reconciled their false assumptions with their (more accurate) observations. Modern science differs in that much (though probably not all) is based upon true background assumptions and employs more reliable methods; it does not differ in that its practitioners are more creative. If creativity is in part responsible for the success of modern science, that is only because it is being used in a particular context.

Furthermore, these comments focussed on published scientific ideas; many ideas will be rejected well before they get to that stage. So the proportion of all creatively produced scientific ideas

[19] Many will regard this as optimistic. If the claim is false, then so much the worse for the idea that scientific creativity is conducive to the truth

that are false is rather greater than the proportion of published ideas that are false. The ideas that reach publication are ones that are the products of both creativity (in conceiving of them in the first place) and judgment (in deciding whether to retain the idea rather than reject it). In summary: works of scientific value tend to be produced by a combination of creativity and judgment, when the background conditions that are conducive to success are in place.

Is the same true for the arts? The artistic output that reaches the public will, as in science, have gone through a process of filtering, from which we may conclude that even if most publicly available artworks have aesthetic value, that is consistent with most artistic ideas, the immediate products of creativity, having little or no value. Many artistic ideas are rejected straightaway by the artist, who does her own assessment of which to pursue (and how to do so). But even if an artistic idea meets her own standards and she chooses to carry it through to completion, very many such works of art have been forgotten; not all of them unjustly. The audience as well as the artist selects from the ideas generated by the artist's creativity; and so though it may appear that it is her creativity that produces the value, it does so only when tempered with judgment. On its own, creativity is not enough. And as in science, the background conditions are important. An artist may need a "room of one's own", the right materials, an artistic context that supplies both sources of inspiration and foils to react against, and perhaps also an audience ready to appreciate what she creates. Success is a combination of all of these factors, and cannot be attributed to creativity alone.

5.2 More creativity does not tend to produce extra value, except in specific and unusual circumstances

The first point to note is that many aesthetically valuable objects can be produced without any creativity at all (or, at most, with minimal creativity). Reproductions of paintings and drawings whose originals are aesthetically valuable, whether careful copies or mass-produced prints, are valuable too. The same goes for each screening of a good movie or playing of a CD or mp3.[20]

[20] Sibley (1985) emphasizes this point.

The point is less obvious for science. However, if we consider that scientific knowledge and understanding are valuable, it is clear that new tokens can be created that are not original. The repetition of a famous experiment in a school laboratory can bring new knowledge and understanding to the students present. So creativity is not necessary for the production of value in the arts and sciences when the objects in question can be duplicated or repeated. Nor would additional creativity be any sort of advantage: precisely what we value in these objects is that they are an exact copy of the original.

However, in the case of a new symphony or a new theory, things are different. Here what is created is an abstract object. For symphony B to differ from symphony A, B must differ in some intrinsic respect from A; likewise for theories. So to create B at all requires creating something novel.[21] But it does not follow that they must all be devised creatively.

Good new scientific ideas can be generated in a systematic way, with little use of the imagination. Salvarsan, the first effective treatment for syphilis was discovered by the systematic synthesis and testing of organic arsenic compounds. When Paul Ehrlich and Sahachiro Hata hypothesised that compound 606 (the sixth compound in the sixth group—arsphenamine) could be have an antisyphilitic capacity, the idea was neither a shot in the dark nor the product of imaginative inspiration. Likewise, following the development of penicillin, Selman Waksman undertook a systematic study of compounds of microbial origin for antibacterial activity, thereby discovering several new antibiotics, including streptomycin, the first antibiotic effective against tuberculosis. Thus there can be hypotheses and discoveries of great scientific value that involve the exercise of the imagination minimally, if at all. Hence it is not the case that all scientifically valuable objects were produced through (substantial) creativity.

Even so, it might still be true that more creativity—more originality, more imagination—tends to produce better ideas and so more valuable objects. But that is not the case. Value is typically

[21] Some hold that abstract objects exist sempiternally and so are not created. If that is your view, then the argument stills holds, *mutatis mutandis* (e.g. replacing 'create' by 'discover').

produced by close attention to previously successful attempts to create value. Thomas Kuhn (1959/1977: 234) expressed the point thus: "Under normal conditions the research scientist is not an innovator but a solver of puzzles, and the puzzles upon which he concentrates are just those which he believes can be both stated and solved within the scientific existing tradition." In this paper, "The Essential Tension", Kuhn emphasised the importance and value of convergent thinking in science: thinking in normal science is highly constrained and it is in large part successful precisely because it is so constrained. The portion of the possible space of scientific ideas permitted by the paradigm is narrow, and this directs the researchers to solutions that are most likely to work. Using the imagination more extensively to find more remote and more original possibilities is unnecessary and unlikely to be fruitful. Only during a crisis, when use of the paradigm to guide the imagination encounters insurmountable problems, is a wider search necessary. It is only at that point that more creativity is a benefit.

That may be true of science, where it is implausible that working outside the established scientific tradition will typically produce good results. But what about art? Surely greater artistic creativity tends to produce better art? And the unconstrained use of the imagination is exactly what we should expect from a successful artist?

The Romantic tradition emphasizes the importance of originality in artistic creation, where this is understood not just as the artist producing something different from what has previously been created, but also that she does so as an expression of her own individual sensibility. According to a rather extreme version of Romanticism, this is best achieved by the artist imaginatively exploring the remotest possibilities, unguided by, perhaps even uncontaminated by awareness of, artistic achievements of the past. We can see one (less extreme) version of this idea in Kant's remarks that creative genius cannot be taught, does not use rules, and cannot succeed through mere imitation (1781/2000, 5: 308, 186–7). More recently, Lee (1957) says that "the creative process can be defined as the ability to think in uncharted waters without influence from conventions set up by past practices."[22]

[22] Cited by L. C. Repucci in Taylor (1988: 118).

One strand of thought in Romanticism values greater creativity not in virtue of the value of the objects produced by it, but because the creative process is regarded as expressing a person's taste, sensibility and individuality. We have not argued against this explanation of the value of creativity here, though some of our examples, including the creative accountants of Enron and the creative torturer Carrier, suggest that expressing one's sensibility is not always to be encouraged. But in any case, any value that the creative process has as an expression of one's individuality, should be distinguished from the value of the objects thereby produced. Even if the mechanical application of a rule or mere imitation of existing works of art is not likely to produce new works of aesthetic value, it does not follow that use of one's imagination without constraints or guides is likely to do better. On the contrary, there are very many possible works of art which an artist might contemplate creating, but the vast majority of them have no value at all. Imaginatively exploring them is a waste of time. How can an artist avoid such a fate; and focus her mind on the possibilities most likely to have value? The answer is obvious: she can look to the past, to valuable works of art that already exist. Of course, unless her purpose is to create reproductions, she must not imitate them exactly. Nor should she attempt to extract rules of artistic creation. Rather she will treat these works, and the tradition from which they come, as guides and exemplars.[23]

Earlier we mentioned two important uses of the imagination in creativity: to find ways of simultaneously meeting a number of constraints at the same time (to find the right poetic form to express a particular emotion, for instance, and then to find the right words within that form); and to bring together ideas perhaps from what were, until now, different artistic traditions, forging an exemplar for the future. In both cases, past successes can be a guide to solving new artistic problems, allowing the artist to fulfil her artistic intentions.

[23] Carroll (2003) makes exactly this argument, emphasizing the importance of artistic traditions in the creation of all valuable works of art. In so doing, his claims for the role of tradition in art parallel those made by Kuhn (1959) regarding scientific traditions.

If this is right, then on the one hand a certain amount of creativity—of imagination, fertility, originality and motivation—is essential to the production of a certain kind of aesthetic value. But on the other hand, more creativity, that is, the imaginative exploration of more remote possibilities, unguided by an artistic tradition or prior works of aesthetic value, is both unnecessary and unlikely to be fruitful.

This is not to say that valuable works of art cannot be produced through a less constrained use of the imagination. Artistic revolutions do occur. But they typically do so because an artist has recognized the limitations of a particular tradition, forcing her to turn further afield to find a way to fulfil her artistic intentions, or to find a possible artwork that meets her own standards of success. At this point—but only at this point—more creativity is better than less. But even then, only certain aspects of the artistic past are rejected. Typically there remains considerable continuity with other aspects of the tradition; features common to the old and the new. This shared background allows artist and audience to find the less familiar artworks intelligible and appealing.[24]

It follows that the Romantics and others who celebrate the completely uninhibited use of the imagination, are either conflating the value of the creative process with the value of its product; or they are generalizing from the (unusual and unrepresentative) situations in which the artistic or scientific tradition fails to be an adequate guide. Either way, they are making a mistake. Furthermore, the Romantic view over-emphasizes the degree of discontinuity: no revolution is a root and branch break with tradition.[25] And even in those aspects where tradition is rejected, it acts as a foil, giving significance to the revolutionary development.

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[24] Carroll 2003: 227.

[25] Kuhn is sometimes caricatured as taking scientific revolutions to involve radical discontinuities. This ignores a whole chapter in *The Structure of Scientific Revolutions* (1962) entitled "Progress Through Revolutions".

Whilst minimal creativity may be necessary to the creation of (almost) all value in the arts and sciences, more substantial creativity is not only unnecessary, but can actually be in tension with the production of value. As we have emphasized, typically, the best way to create value is to focus your imagination on a range of possibilities, guided by previously successful attempts at producing value. This will be the most successful strategy except in highly unusual situations, in which you have reached the limits of an artistic or scientific tradition. Allowing your imagination to roam freely across broader or more distant spaces of possibility, generating wildly novel ideas, is a pleasant distraction; an activity that is a substitute for, not a means to, the creation of value. In normal circumstances, more substantial creativity tends to result in less scientific and aesthetic value, than less creativity would produce. It is a waste of time and effort.

6 Conclusion

Creativity is widely thought to be of great value. The value accorded to it would make sense if it were a disposition to produce valuable and original ideas (especially ideas of aesthetic and scientific value). Yet the argument typically given for the standard view, the "original nonsense" argument, is unsound. Moreover, we have shown that creativity can produce objects of no value (as with Carrier's Republican Marriage, the accountants of Enron, and perhaps the less successful efforts of avant-garde or conceptual artists); or can result in a mixture of good or bad ideas (as in Herschel and Tesla).

We propose that creativity is essentially a matter of the imagination: it is the disposition to produce many novel ideas through the imagination, and the motivation to bring those ideas to fruition. Even though such a disposition will not necessarily produce valuable ideas and objects (not even ceteris paribus), one might still think that it is likely to produce value: the more creative an individual is, the better, and the less she is constrained or guided by tradition, the more creative she will be. We deny all this. Creativity tends to produce works of value only when two additional conditions are in place: a tradition of models and exemplars that are themselves valuable, to stimulate and guide the imagination in its search for new items of value;

and good judgment to discern which of the new ideas produced by the imagination do indeed have value.

This means, of course, that we are not against creativity in all its manifestations. We accept that minimal creativity is essential to virtually any artistic or scientific activity. We acknowledge that, in the right circumstances and aided by well-trained judgment, creativity does produce valuable new ideas. What we are against is the unreflective approval of creativity even when these conditions are not met. This attitude is both widespread and deeply misguided, since it leads us to look for aesthetic and scientific value in all the wrong places, instead of where we know it can be found: in the imaginative transformation of the scientific and artistic tradition.

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References

Barron, F. (1955) "The disposition towards originality" *Journal of Abnormal and Social Psychology*, 51, 478–85.

Boden, M. (2010) *Creativity and Art*. Oxford: Oxford University Press.

Carroll, N. 2003. "Art, creativity, and tradition" in B. Gaut and P. Livingston (eds), The Creation of Art: New Essays in Philosophical Aesthetics. Cambridge: Cambridge University Press, 208–34.

Collins, M. A., and T. M. Amabile. (1999) "Motivation and creativity" in R. Sternberg (ed.) *Handbook of Creativity*. Cambridge: Cambridge University Press, 297–312.

Cropley, D. H. and A. J. Cropley. (2013) *Creativity and Crime: A Psychological Analysis* Cambridge: Cambridge University Press.

Currie, G., and I. Ravenscroft. (2002) *Recreative Minds: Imagination in Philosophy and Psychology*, Oxford: Oxford University Press.

Dunbar, K. (1996) "How scientists really reason" in R. Sternberg and J. Davidson (eds), *The Nature of Insight*. Cambridge MA: MIT Press, 365–95.

Eslinger, P. J., G. Zappalà, F. Chakara, and A. M. Barrett. (2007) "Cognitive impairments after TBI" in N. D. Zasler, D. I. Katz, R. D. Zafonte (eds) *Brain Injury Medicine Principles and Practice*. New York NY: Demos, 779–90.

Elster, J. (2000) *Ulysses Unbound*. Cambridge: Cambridge University Press.

Frege, G. (1893, 1903) *Grundgesetze der Arithmetik*, Bände I, II. Jena: Verlag Herman Pohle.

Gaut, B. and P. Livingston. (2003) "The creation of art. Issues and perspectives" in B. Gaut and P. Livingston (eds) *The Creation of Art. New essays in philosophical aesthetics*. Cambridge: Cambridge University Press, 1–32.

Gentner, D., K. J. Holyoak, and B. Kokinov. (2001) *The Analogical Mind: Perspectives from Cognitive Science*. Cambridge MA: MIT Press.

Gentner, D., and M. Jeziorski. (1993) “The shift from metaphor to analogy in western science” in A. Ortony (ed.), *Metaphor and Thought* (2nd ed.) Cambridge: Cambridge University Press, 447–80.

Götz, I. (1981) “On defining creativity” *Journal of Aesthetics and Art Criticism*, 39, 297–301.

Grant, J. (2012) “The value of imaginativeness” *Australasian Journal of Philosophy*, 90, 275–89.

Hills, A. E. and A. J. Bird.(2018) “Creativity without value” in *Creativity and Philosophy*, (eds. B. Gaut and M. Kieran) Abingdon: Routledge, 95–107.

Kant, I. (1790/2000) *Critique of the Power of Judgment*. (Ed. P. Guyer, trans P. Guyer and E. Matthews.) Cambridge: Cambridge University Press.

Kind, A. (2016) “Introduction. Exploring imagination” in A. Kind (ed.) *Routledge Handbook of Philosophy of Imagination*. Abingdon: Routledge, 10–11.

Kieran, M. (2014) “Creativity as a Virtue of Character” in E. Paul and S. Kauffman (eds.), *The Philosophy of Creativity: New Essays*. Oxford: Oxford University Press; 125–44.

Kuhn, T. S. (1959/1977) “The essential tension: Tradition and innovation in scientific research” in *The Third (1959) University of Utah Research Conference on the Identification of Scientific Talent*, 162–74, Salt Lake City, UT, 1959. University of Utah Press. Page references to the reprint in T. S. Kuhn 1977 *The Essential Tension. Selected Studies in Scientific Tradition and Change* Chicago: University of Chicago Press, 225–39.

Kuhn, T. S. (1970) *The Structure of Scientific Revolutions*. (2nd edition.) Chicago IL: University of Chicago Press.

Lee, W. J. (1959) Discussant in *The Arden House conference on motivating the creative process* New York, NY: Harriman.

Margolis, H. (1987) *Patterns, Thinking, and Cognition. A theory of judgment*. Chicago IL: University of Chicago Press.

McCormack, J. and M. d'Inverno. (2012) *Computers and Creativity*. Berlin: Springer.

Meager R. (1958) "The uniqueness of a work of art" *Proceedings of the Aristotelian Society*, 59, 49–70.

Merrotsy, P. (2013) "A note on Big-C Creativity and little-c creativity" *Creativity Research Journal*, 25, 474–76.

Mill, J. S. (1859) *On Liberty*. London: J. W. Parker.

Paul, E. S. and S. B. Kaufman. (2014) "Introducing *The Philosophy of Creativity*" in The *Philosophy of Creativity: New essays* Oxford: Oxford University Press, 3–14.

Poincaré, H. (1908/1914) *Science et Méthode* (trans. F. Maitland, as *Science and Method* London: Nelson).

Runco, M. A. and G. J. Jaeger. (2012) "The standard definition of creativity" *Creativity Research Journal*, 24, 92–6.

Russell, B. (1962) Letter to Professor van Heijenoort, in J. van Heijenoort (ed.) *From Frege to Gödel. A Sourcebook in Mathematical Logic, 1879–1931*. Cambridge MA: Harvard University Press, 127.

Saccheri, G. G. (1733) *Euclides ab omni nævo vindicatus*. Milan.

Schellekens, E. (2007) "The aesthetic value of ideas" in P. Goldie and E. Schellekens (eds) *Philosophy and Conceptual Art* Oxford: Oxford University Press, 71–91.

Sibley, F. N. (1985) "Originality and value" *British Journal of Aesthetics*, 25, 169–84.

Sternberg, R J. and T. I. Lubart. (1999) "The concept of creativity: Prospects and paradigms" in R. J. Sternberg (ed.) *Handbook of Creativity*. Cambridge: Cambridge University Press.

Stokes, D. (2016) "Imagination and creativity" in A. Kind (ed.) *The Routledge Handbook of the Philosophy of Imagination*. Abingdon: Routledge, 247–61.

Taylor, C. W. (1988) "Various approaches to and definitions of creativity" in R. Sternberg (ed.) *The Nature of Creativity. Contemporary psychological perspectives* Cambridge: Cambridge University Press, 99–121.

Walton, K. (1990) *Mimesis as Make-Believe*, Cambridge MA: Harvard University Press.

Zagzebski, L. (1996) *Virtues of the Mind: An Inquiry into the Nature of Virtue and the Ethical Foundations of Knowledge*. Cambridge: Cambridge University Press.